(31) That it is desirable that the Royal Society should be informed, at a date not later than January 1, 1898, what steps (if any) are being taken, or are likely to be taken, in the countries whose Governments are represented at the Conference, towards establishing organisations for the purpose of securing the end had in view in Resolution 16.

Qu'il est désirable que la Société Royale reçoive communication, au plus tard le 1$^{er}$ janvier, 1898, des démarches qui ont été prises ou seront prises par les gouvernements des pays représentés à la Conférence pour l'exécution de la résolution 16.

Es ist wünschenswerth, dass die Royal Society nicht später als bis zum 1. Januar 1898, darüber verständigt werde, welche Schritte von Seiten der Länder welche Delegirte zur Versammlung gesendet haben gethan oder in Aussicht genommen sind, um Einrichtungen zu treffen welche die Durchführung des Beschlusses 16 ermöglichen.

(32) That the Delegates, in reporting to their respective Governments the Proceedings of the Conference, should call immediate attention to Resolutions 16 and 31.

Que les délégués sont invités en faisant rapport à leurs gouvernements à attirer spécialement l'attention sur les résolutions 16 et 31.

Die Delegirten wollen in den Berichten an ihren Regierungen über den Verlauf der Versammlung, die besondere Aufmerksamkeit auf die Beschlüsse 16 und 31 lenken.

(33) That January 1, 1900, be fixed as the date of the beginning of the catalogue.

Que le début du catalogue soit fixé au 1$^{er}$ janvier, 1900.

Es soll der 1. Januar 1900 als Datum für den Anfang des Cataloges festgesetzt werden.

(34) That the Royal Society be requested to undertake the editing, publication, and distribution of a verbatim report of the Proceedings of the Conference.

La Société Royale est prié de se charger de la confection, de la publication, et de la distribution d'un compte rendu textuel des travaux de la Conférence.

Die Royal Society wird ersucht, die Abfassung, Veröffentlichung und Versendung eines wörtlichen Berichtes der Verhandlungen der Conferenz zu übernehmen.

(35) That the *procès verbal* of the Conference be signed by the President and Secretaries.

(36) That this Conference requests the Royal Society to express to the Lord Mayor of London and to Dr. L. Mond their grateful, hearty appreciation of the hospitality shown by them to the Delegates.

(37) On the motion of M. Darboux, a vote of thanks to Sir John Gorst, for presiding over the Conference and his conduct in the chair, was passed by acclamation.

(38) On the motion of Prof. Weiss, a vote of thanks to the Royal Society, for their cordial reception of the Delegates, was unanimously carried.

Signed { JOHN E. GORST, President.
HENRY E. ARMSTRONG }
WALTHER DYCK } Secretaries.
F. A. FOREL }

## ARCHÆOLOGICAL STUDIES IN MEXICO.

MR. WILLIAM H. HOLMES, who has been so long and favourably known in connection with the Smithsonian Institute at Washington, has lately been placed in charge of the Department of Anthropology at the Field Columbian Museum at Chicago, and has now issued from his department the first volume of what promises to be a most interesting series of anthropological publications.

Soon after Mr. Holmes had moved to his new post, Mr. Alison Armour, of Chicago, who takes a keen interest in archæological studies, invited (to quote from Mr. Holmes's preface) a number of "gentlemen representing different branches of scientific research to accompany him in his steam yacht *Ituna* on a voyage to Mexico. Three months were spent in that most interesting country, mainly in the States of Yucatan, Chiapas, and Oaxaca. The writer (Mr. Holmes) was a member of the party, and, as Curator of Anthropology in the Field Columbian Museum, was expected to examine and describe such archæologic remains as happened to be encountered during the journey."

Mr. Holmes made excellent use of his opportunities, and we now have the first instalment of his Report, intituled "Archæological Studies among the Ancient Cities of Mexico," dealing particularly with the monuments of Yucatan.

After an introductory chapter (with excellent illustrations), which treats of the materials and methods used in construction of Maya buildings, Mr. Holmes describes in turn the different groups of ruins which were visited, beginning with those on the islands lying close to the eastern coast of the peninsula, Mugeres, Cancun, and Cozumel. An excellent reproduction of a photograph, taken by Mr. E. H. Thompson, shows the very curious portal of a small temple on the last-named island, with one of the two supporting columns formed of a kneeling human figure.

On first opening Mr. Holmes's report I turned over the pages hastily to find an account of the ruins of Tuloom, but was doomed to disappointment. On page 75 is the following paragraph: "The most important group of ruins on the east coast of Yucatan, so far as the remains have been reported, is that known as Tuloom. It is situated on a high bluff overlooking the sea, some twenty-five miles south-west of San Miguel, the main settlement of the island of Cozumel. It was visited by Stephens in 1840, and he has given us the only available account[1] published up to date. This place must have been an important stronghold of the ancient Mayas, although it was not visited by the early Spaniards, so far as our records show. It is a remarkable circumstance that this place is held to-day by a Maya tribe which has never been permanently subdued by the Spaniards or Mexicans, and which now holds it as an outpost, being at war with the Mexican Government and with all intruders, whatsoever their nationality. At the time of our visit to Cozumel there were special symptoms of hostility, and the sub-chief, to whom the Tuloom district was entrusted by the principal chief, whose headquarters are some distance inland, had recently been summarily executed for permitting trade between his people and the inhabitants of Cozumel. It was natural, therefore, when the leading citizen of Cozumel, Don Pedro Perez, assured us that we would certainly be fired upon by the hostiles if we attempted to land, that the project of studying this ruin was abandoned."

I most fully sympathise with the travellers in their disappointment in failing to examine this important site, which, as far as I know, has never since the time of Stephens and Catherwood been visited by any one capable of giving an adequate description of the ruins.

The yacht then sailed round the north of the peninsula, and the travellers were landed at Progreso, whence a land journey was taken to visit the celebrated ruins of Uxmal, Izamal, and Chichén Itzá.

Uxmal is so easy of access, and has been so often visited, photographed, and described, that Mr. Holmes could not be expected during a short visit to discover anything which would add to our previous knowledge; but the admirably clear description which he gives of the ruins is accompanied by a plan and by a most carefully compiled panoramic view of the site, which will prove of the greatest assistance to the reader.

Plate vii. gives a photograph of an inscribed column or stela discovered by Mr. Thompson, which is of the utmost value, as so very few examples of carved hieroglyphic inscriptions have as yet been found in Yucatan, and a comparison of the Yucatec inscriptions with the numerous inscriptions found in Guatemala and Chiapas is a matter of the highest interest to students of American archæology.

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[1] Stephens' "Incidents of Travel in Yucatan," vol. i. p. 390.

I trust that in a future publication Mr. Holmes will give us a drawing of the whole of the inscription on this stela, as only a portion of it is shown in the photograph.

After a glance at Izamal the travellers went on to Chichén Itzá, where they remained for a week. As I was myself encamped for five months at Chichén Itzá in 1889, engaged in clearing and examining the ruins, I am well able to appreciate the great extent and excellence of the work accomplished by Mr. Holmes during the short time at his disposal. The property on which the ruins stand has recently passed into the possession of Mr. E. H. Thompson, formerly United States Consul in Merida, who has for many years been an ardent student of Maya archæology, and amongst other work has made an exhaustive examination of the ruins of Labná for the Peabody Institute at Harvard. Now that Mr. Thompson is resident at Chichén, we may look forward to many interesting discoveries by one who has had such long experience in the field.

I can only express my regret that at the time of his visit Mr. Holmes had not yet received copies of my plans and photographs (the first portion of which has been published in the *Biologia Centrali Americana*, vol iii.), as his corrections and criticisms made on the spot would have been of the utmost value.

Mr. Holmes's work has been so well done, and must be so acceptable to all students of the subject, that I have some fear that it may seem almost ungracious on my part to note what appear to me some few errors which my longer residence in the ruins enable me to detect.

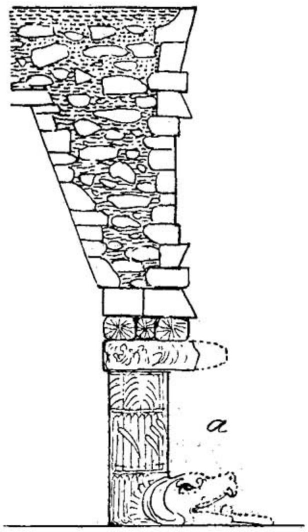
On p. 114, the mutilated figures in the niches on either side of the mask over the doorway of the "Iglesia" are not human figures, but apparently humanised animals, one being a turtle and another an alligator.

On pp. 116–117, the curious round tower known as the "Caracol," is figured and described as symmetrically placed on its double terraces; but I found the upper terrace to be curiously uneven, and unsymmetrically placed on the lower one.

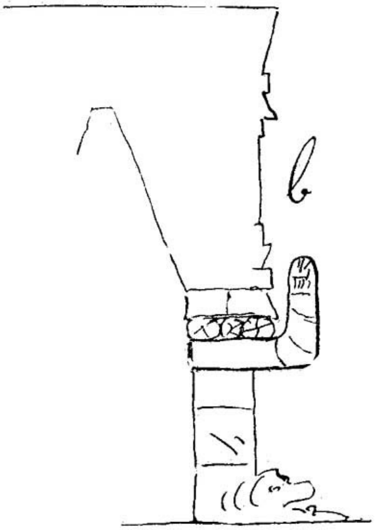
On p. 119, Mr. Holmes states: "The exterior conformation of this strange tower can be made out in part only. The lower wall is of ordinary masonry, finished in plaster, and broken only by the four entrances. It rises nine or ten feet to the base of the formidable, five-membered moulding, which projects two feet from the wall face and is five feet in width, being the only example of its kind in Yucatan. The upper margin is opposite the middle of the arch slope within, as seen in the section. The masonry at this level is four feet thick.

"In studying this part of the building the very interesting question arose as to whether the exterior wall surface above this moulding rose vertically or whether it sloped inwards toward the upper turret. I had the good fortune to find one vertical stone, representing the first course above the moulding, in place, and this I regard as conclusive proof that the upper wall-zone was vertical. This conclusion is confirmed by the fact that in all cases in Yucatan and Chiapas, so far as I have observed, where the upper mural zone slopes, it includes with it in the slope not only all the courses above the medial mouldings, but the medial mouldings themselves, whereas in this case the mouldings are vertical." This conclusion is of considerable importance, and shows that I have fallen into an error in my figuring of the upper part of the Caracol (*Biol. Centr. Am.*, vol. iii. plate 20), and makes me regret all the more that my plans and photographs were not in Mr. Holmes's hands when he was at Chichén.

On p. 124, in describing the "Castillo," Mr. Holmes suggests that the balustrades of all four stairways ended in serpents' heads; but this is the case in the northern stairway only. I moved many tons of earth and stones in order to uncover the base of the western stairway, and found the end of the balustrade to be without any ornament whatever. I cannot agree with Mr. Holmes in the assumption that the corners of the pyramidal foundation were ornamented with great serpents' bodies "following in and out the nine-terraced steps." The structure of the rounded corners of the pyramid can be fairly well made out at the north-east angle; but in all probability it was thickly overgrown, and so escaped notice.



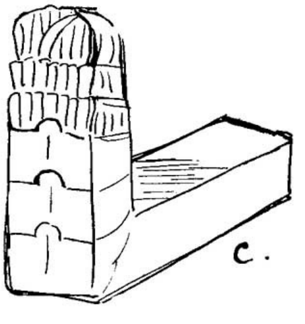
In describing the portal of the Castillo, and the portal of the temple on the wall of the Ball Court (the temple of the Tigres), Mr. Holmes has just failed to catch the full structure of the serpent columns. These columns are markedly characteristic of Chichén Itzá, and the portals of no less than six of the temples were supported by them. One is figured in the frontispiece (Plate 1), and again in the sections of the Castillo and of the Ball Court temple. The figure here reproduced (*a*) is from the section of the Castillo (p. 123). The more correct drawing would be as in (*b*), the projection from



the capital (*c*) of the column, turning upwards and being carved to represent the rattles on a rattlesnake's tail, with the addition, in some instances, of a plume of feathers.

It is this peculiar form of capital which has done so much to ensure the ruin of the façades of the Chichén Itzá temples; for the weight of the projecting tail tilted the capital outwards as the wooden beam above it decayed.

Some of these queer-shaped capitals (*c*) can be found lying on the slopes or at the bottom of the pyramidal foundations of the temples; and it is only in the case of the Castillo, where the projecting tail has been broken off, as shown in Fig. *a*, that the façade of the temple has escaped destruction.



On page 132 it is stated that "the lintel beams of the doorway (temple of the Tigres), three in number, and set as indicated in the section, are covered with well-executed glyphs." For "glyphs" must be here read "ornaments," as there is no trace of any hieroglyphic inscription.

I notice that in describing the painted mural decoration of the interior of this temple no notice is taken of the picture above the doorway of a human sacrifice, and I greatly fear it must have disappeared since I traced it in its already mutilated condition in 1889.

Mr. Holmes was not able to attempt any detailed examination of the great group of colonnades and temples which lie to the east and south-east of the Castillo. These I surveyed in 1889, but had no time to make satisfactory excavations, and I greatly envy Mr. E. Thompson the opportunity he has of making a thorough exploration of these most interesting remains.

There is one point on which I hope Mr. Holmes will give us some further enlightenment. On page 102 he states, without quoting his authorities, that Chichén Itzá was occupied by its builders for nearly 200 years after its discovery by the Spaniards.

I have endeavoured to show in my own account of the ruins (*Biol. Centr. Am.*, vol. iii. pp. 5-9), that the statement that the Spaniards encamped at Chichén in 1528 must be received with caution, and neither Bishop Landa, nor the report drawn up at Valladolid in 1579, appear to me to indicate any occupation of Chichén by the Mayas at the time of the conquest, although it may still have been held in reverence as a place of pilgrimage.

Part i. of Mr. Holmes's report ends with the description of Chichén Itzá. The descriptions throughout are lucid, and the illustrations numerous and excellent. All students of American archæology will eagerly look forward to the succeeding issues, and will, I feel sure, join me in hearty congratulations to Mr. Holmes on the excellence of his work, and to the Field Columbian Museum on having thus been able to utilise his services; and all of us, who have expensive scientific hobbies, must wish that there were more Alison Armours in the world to give such splendid and timely help to scientific research.

ALFRED P. MAUDSLAY.

## MEASUREMENT OF CLOUD HEIGHTS AND VELOCITIES.[1]

THE study of the form and motion of the clouds has been a favourite subject with meteorologists and physicists from the earliest times. Among the first works, since the invention of printing, may be mentioned one by J. Alkindus (Venice, 1507), dealing with clouds in general, and one on the height of clouds, by J. Bernoulli, "Nova ratio metiendi altitudines nubium" (Lipsiae, 1688). But it is only during the last quarter of a century, since it has been recognised that cyclones and anticyclones form part of the general circulation of the atmosphere, that the importance of a systematic study of the upper air-currents by means of clouds has been fully appreciated. For this purpose various methods, both with and without instruments, have been employed. In 1878 the Meteorological Council decided upon undertaking a series of experiments at the Kew Observatory, with a view of obtaining records of the height and velocity of clouds, by means of photography, for which purpose cameras fitted with theodolite mountings, and provided with altitude and azimuth circles, were used. The results of subsequent investigations, in which the exposure of the plates was effected by electrical means, were published in the *Proceedings* of the Royal Society, vol. xlix. p. 467. In vol. viii. p. 108, of the *American Meteorological Journal*, Mr. Rotch gives an account of the measurements of cloud velocities at Blue Hill Observatory, Massachusetts, by timing the movement of shadows cast by the clouds at points whose distance apart was known. During the present year, owing to the action taken by the International Meteorological Committee, cloud observations are being made in all parts of the globe, and instructions for the use of special instruments have been drawn up, at the request of the Committee, by Dr. Hildebrandsson, of Upsala. The majority of stations, if they use instruments at all, restrict themselves to the use of simple nephoscopes, which give the direction and apparent velocity of the clouds, by means of a mirror and graduated circles; in these instruments the observations are not influenced by the effects of perspective, which are the same in the sky and in the mirror. At some of the principal observatories theodolites and photogrammeters are being used. Each of the last two methods has its advantages and disadvantages; theodolites are simpler and cheaper, while photogrammeters require a certain amount of skill in photography. The

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[1] "Wolkenhöhenmessungen," von E. Kayser (*Schriften der Naturforschenden Gesellschaft in Danzig*, 1895); "Des principales méthodes employées pour observer et mesurer les nuages," par H. H. Hildebrandsson et K. L. Hagström (Upsala, 1893).